GENERALITAT VALENCIANA
CONSELLERIA D'INFRAESTRUCTURES I TRANSPORT

gvSIG 1.1.2
Extensión Dielmo Open Lidar 0.1
Manual de usuario 1.0

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Introducción

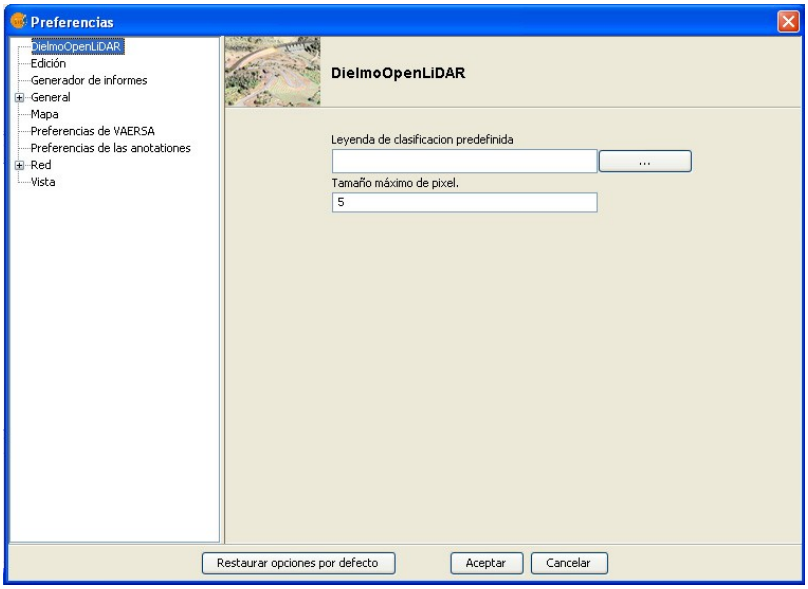
Bienvenidos al manual de uso de DielmoOpenLiDAR. La intención de esta extensión es la de incorporar al software libre gvSIG la capacidad de manejar y visualizar ficheros LiDAR en los formatos estándar LAS y BIN. DielmoOpenLiDAR está pensado para manejar grandes volúmenes de datos LiDAR (cientos de GigaBytes) de una forma rápida y robusta. Para ello, no carga los datos en memoria y solamente pinta los datos necesarios en función de la escala de visualización.

En concreto, hemos añadido a gvSIG las siguientes funcionalidades:

- Driver para el acceso a los datos LiDAR en formato LAS 1.0, LAS 1.1 LAS 1.2 y BIN (formatos del 2001 y 2002) para lectura y escritura.
- Botones para aplicar simbología automática en función de la altura, intensidad o clasificación a todas las capas LiDAR disponibles en una vista de gvSIG.
- Botón para volver a aplicar una leyenda por defecto a las capas LiDAR, de forma que cada una se pinte con un símbolo único aleatorio.

Configuración de las preferencias

Para entrar en las preferencias hay que ir al menú ventana/preferencias o pulsar el botón correspondiente en la vista y luego seleccionar el apartado DielmoOpenLiDAR y nos aparecerá esta ventana:



El primero de los parámetros que podemos configurar es la Leyenda de clasificación preferida. Su uso se explica en el apartado "Manejo de datos LiDAR en gvSIG" en la descripción del botón que pinta los datos en función de la clasificación.

Por otro lado, a la hora de visualizar los datos LiDAR en la vista, dependiendo de la escala de visualización los puntos se pintan con tamaños diferentes. Por ejemplo, cuando estamos muy lejos se pinta solamente un pixel por punto y cuando estamos muy cerca se pintan los puntos con un grosor mayor para que se visualicen mejor. El segundo parámetro es el tamaño máximo del pixel que indica el grosor máximo que tendrán los puntos. Este parámetro es interesante a la hora de superponer los datos LiDAR con ortofotos, de forma que podamos ajustar el grosor para una mejor visualización.

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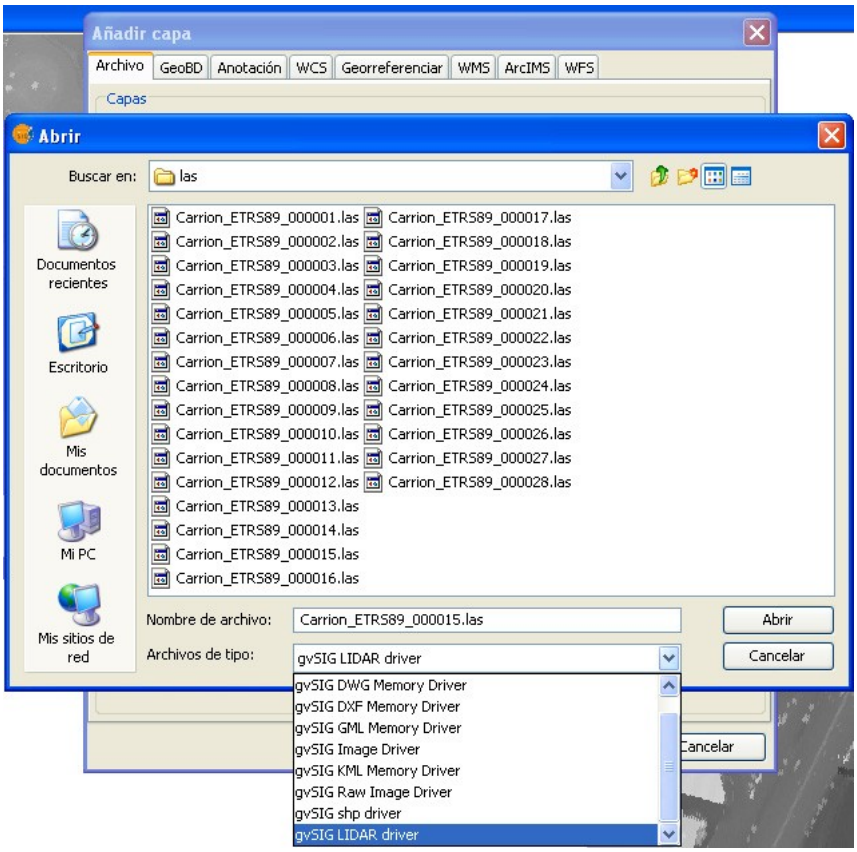
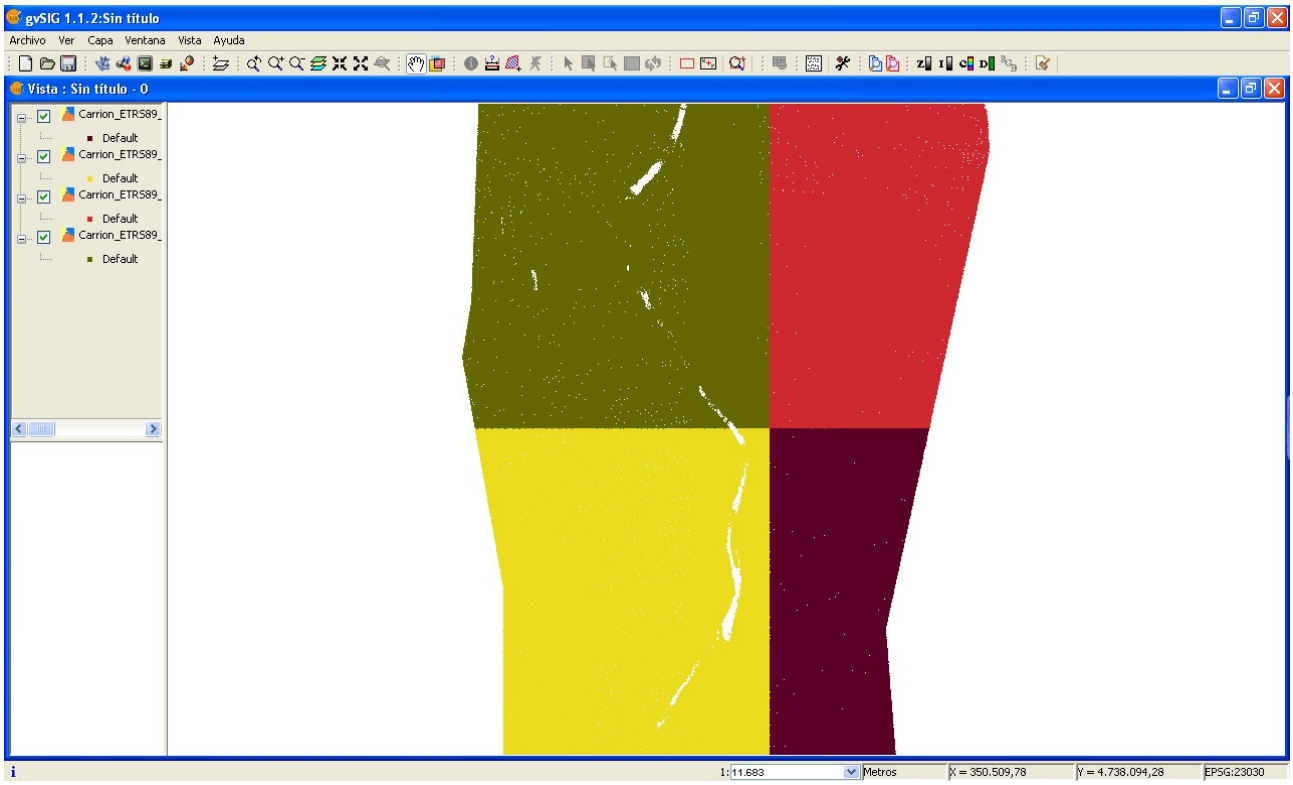
Manejo de datos LiDAR

Una vez instalada la extensión aparecerá un nuevo driver (gvSIG LiDAR driver) en la ventana de añadir capa por fichero, y es el que debemos seleccionar para abrir un fichero LiDAR en formato LAS o BIN.

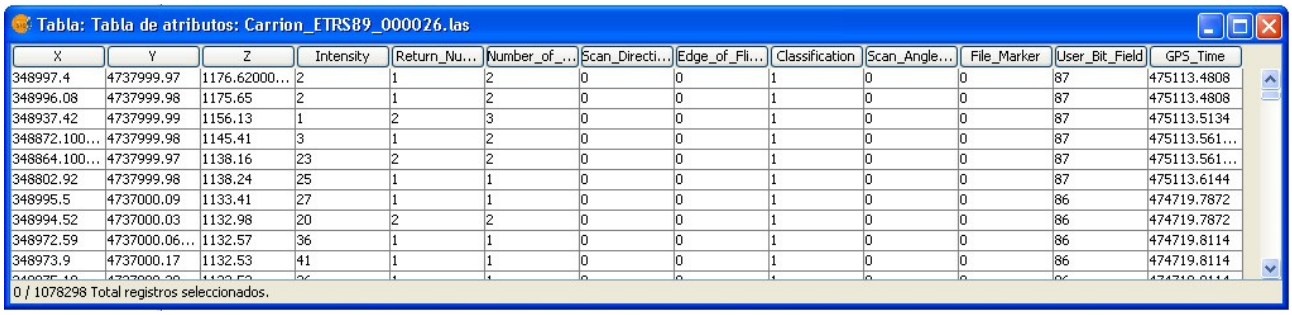


Al abrir un fichero LiDAR, éste se añade al TOC de la vista como si se tratara de una capa vectorial de puntos, aplicando un color aleatorio para cada capa. A continuación vemos como aparecen 4 ficheros LiDAR por defecto al abrirlos en gvSIG.

Estos ficheros tienen una tabla asociada que en función del formato tendrá más o menos columnas y que contiene información asociada a cada punto como la altura, intensidad, clasificación, tiempo GPS, etc. Al comenzar la edición podemos



cambiar los valores de esta tabla, pero no podremos modificar la estructura de la tabla al no permitirlo los formatos de este tipo de datos.



Al abrir estos ficheros en la vista aparece esta nueva barra de botones que utilizaremos para cambiar de forma automática la simbología de las capas LiDAR que tengamos abiertas en la vista.

A continuación pasamos a describir lo que hace cada uno de estos botones.

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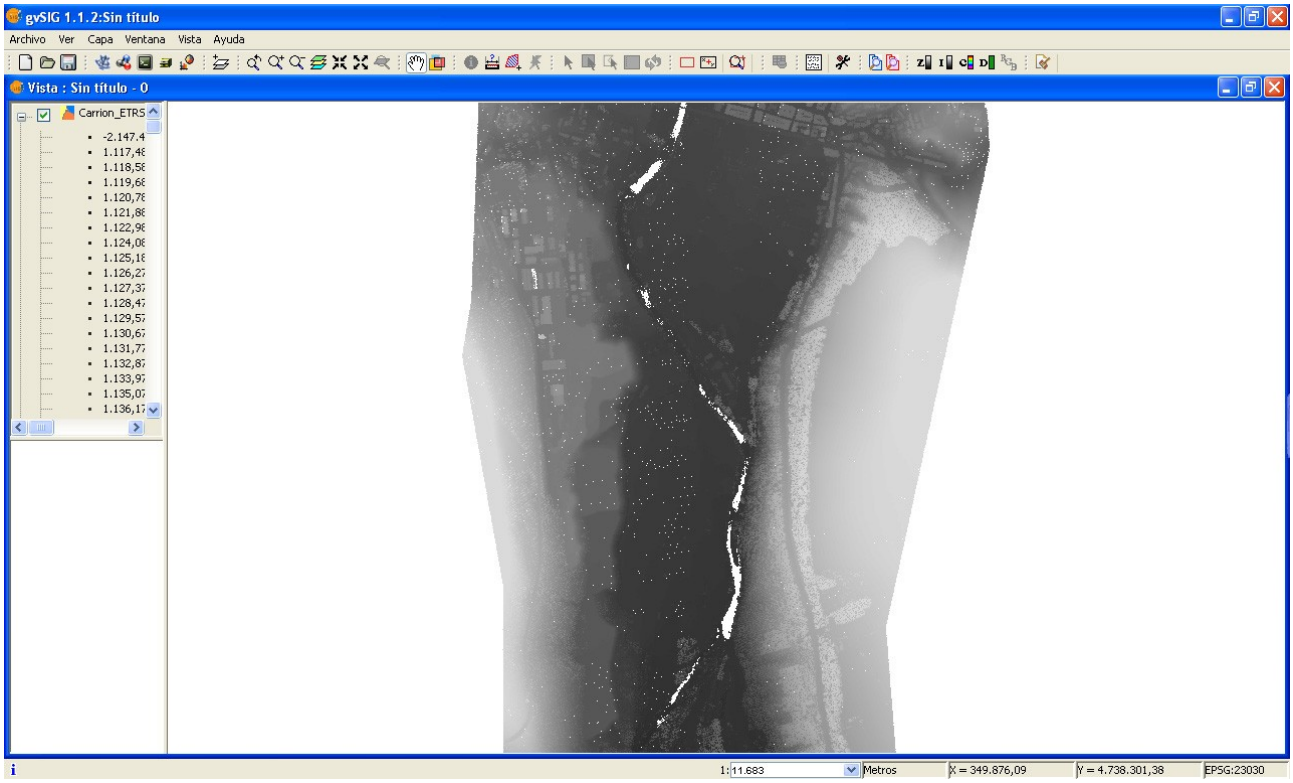
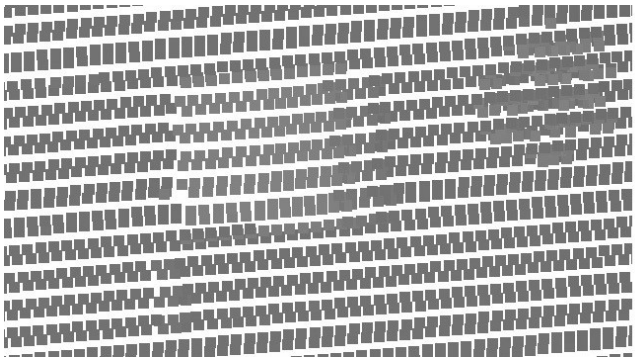
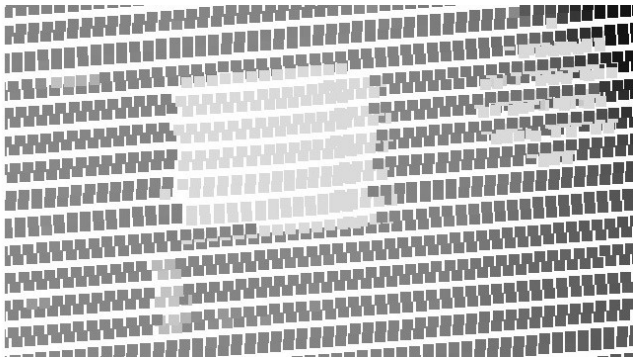
Pinta los datos LiDAR en función de la altura. Al pinchar en este botón se realiza un cálculo estadístico de los valores de altura de los puntos que caen dentro de la vista. De esta forma, podemos ir ajustando la simbología para que se visualicen con más detalle las zonas que nos interesan. Esta simbología se aplica a todas las capas LiDAR disponibles en la vista, de forma que los datos se visualizan todos con la misma simbología y no se nota donde está el cambio de una capa a otra. Por ejemplo, a continuación vemos los mismos datos que en la figura anterior, pero después de haber pulsado este botón:



Al hacer zoom en una zona más pequeña, si tenemos ajustado el rango de colores para visualizar toda la extensión de los ficheros u otra zona de los mismos, es posible que no se visualicen los datos con mucho detalle (ejemplo a la izquierda en la figura siguiente), pero si volvemos a pulsar sobre este botón, se volverá a calcular la leyenda en función de los datos que estamos visualizando (ejemplo a la derecha en la figura siguiente), de forma ahora se puede distinguir mejor el rango de alturas que

tenemos en pantalla.





Pinta los datos LiDAR en función de la intensidad. Al pinchar en este botón también se realiza un cálculo estadístico de los valores de intensidad de los puntos que caen dentro de la vista. De esta forma, podemos ir ajustando la simbología para que se visualicen con más detalle las zonas que nos interesan. Esta simbología se aplica a todas las capas LiDAR disponibles en la vista, de forma que los datos se visualizan todos con la misma simbología y no se nota donde está el cambio de una capa a otra. Por ejemplo, a continuación vemos los mismos datos que en los ejemplos anteriores pero pintados en función de la intensidad:

Al igual que en el caso de las alturas, si cada vez que pulsamos a este botón se calcula una nueva simbología en función de los valores de intensidad de los puntos que caen dentro de la vista, y esto se puede utilizar para buscar el rango que mejor se ajusta a nuestras necesidades.

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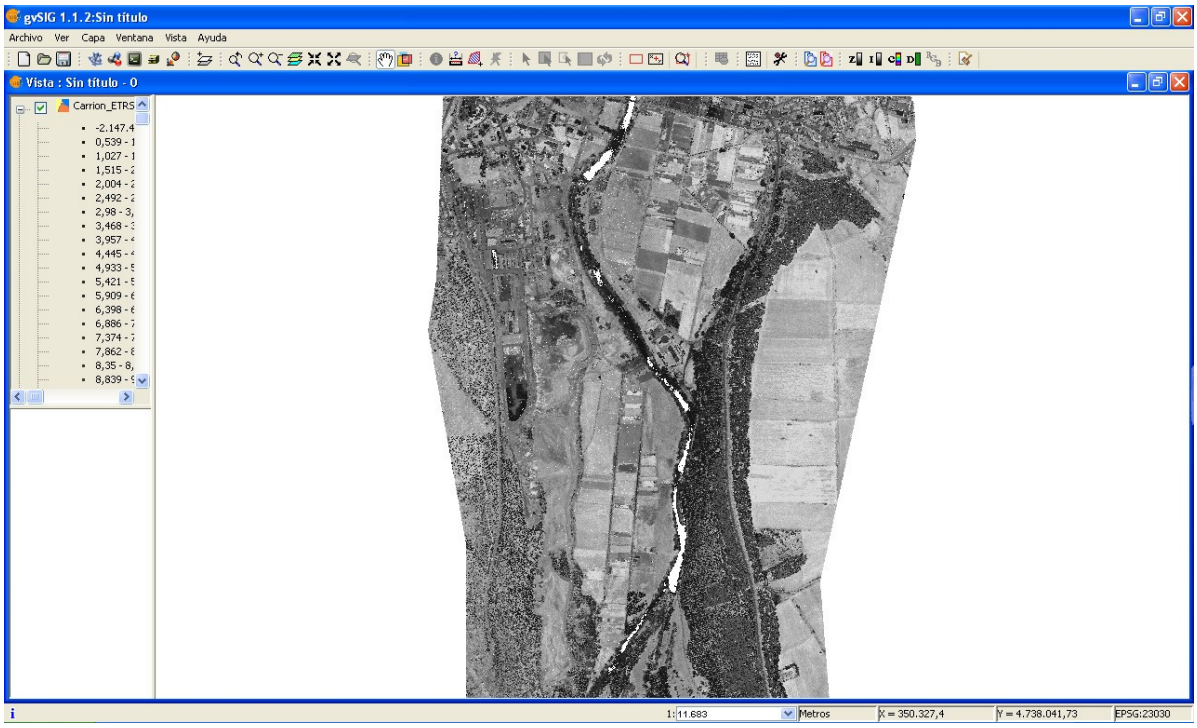
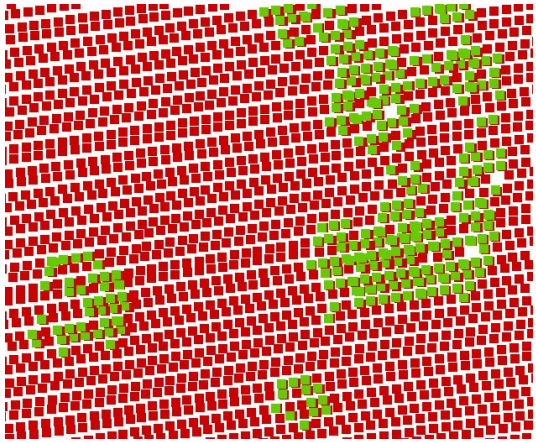


Pinta los datos LiDAR en función de los valores de la columna de clasificación que aparece en la tabla de cada fichero LiDAR. Dado que cada usuario puede definir sus propias tablas de clasificación, lo que hace este botón es aplicar una leyenda que previamente hemos definido con los valores y colores deseados y que hemos guardado en un fichero de leyenda de gvSIG.



Por lo tanto, para que este botón surta efecto, previamente tendremos que:

- Definir la leyenda que nos gustaría aplicar a los valores de clasificación de nuestros datos LiDAR.
- Guardar dicha leyenda en un fichero de leyenda de gvSIG
- Indicar la ruta de este fichero dentro de las preferencias.

Vuelve a pintar los datos LiDAR con la simbología por defecto, aplicando un color aleatorio a cada una de las capas. De esta forma podemos saber la extensión que ocupa cada uno de los ficheros.

En capas que disponen de color rgb (formatos BIN y LAS 1.2) es posible pintarlas con su color correspondiente. Como puede haber capas en la vista que no dispongan de rgb, cuando se pulsa este botón a esas capas se le aplicara la leyenda por defecto. Sino hay capas que tengan rgb este botón quedara inhabilitado. Veamos como queda una capa con rgb.

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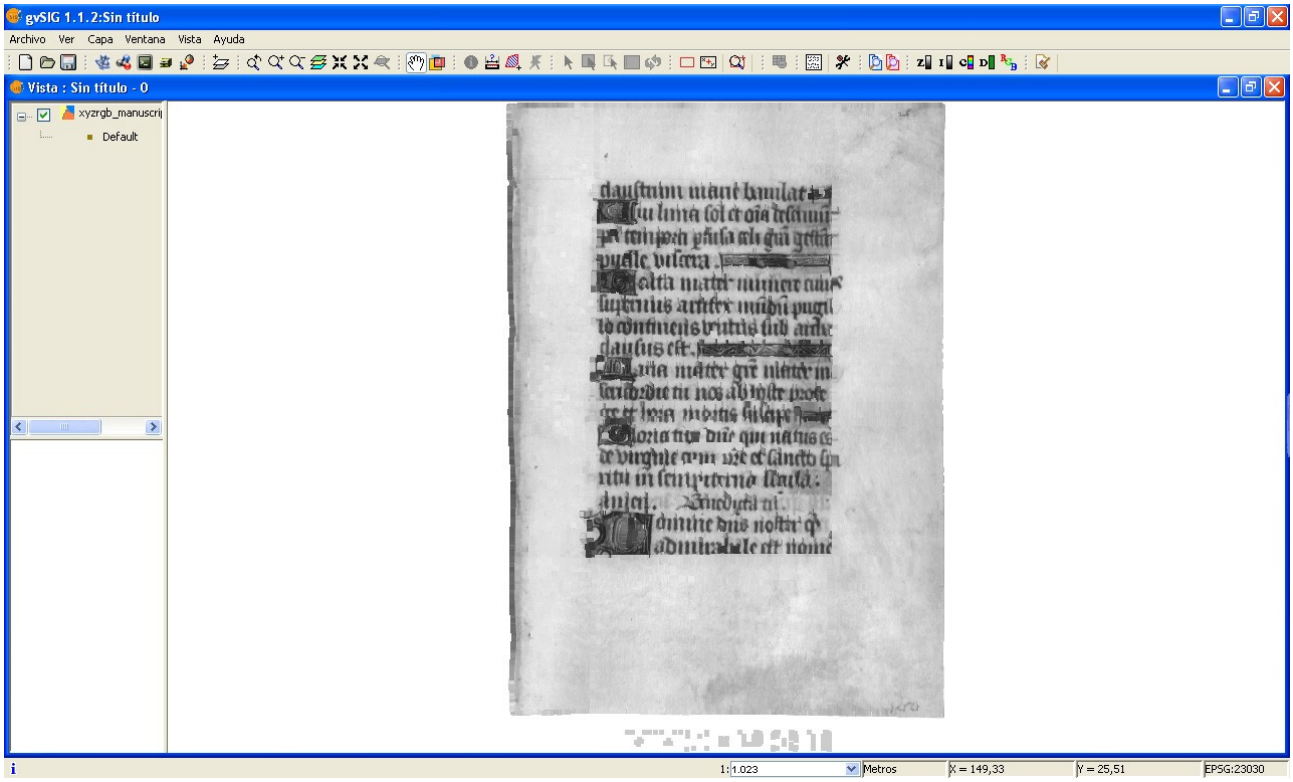

Nota Técnica:

Algunos ficheros LIDAR, pueden ocasionar problemas en la edición debido al consumo de memoria de JVM.

Para solucionar este problema, se puede ampliar la memoria en el fichero instalable gvSIG.sh, abriéndolo como fichero de testo y modificando la frase "-Xmx500M " ampliando hasta 1000 ó 2000, dependiendo de la memoria Ram de nuestro ordenador y de la maquina virtual instalada.

Más información, actualizaciones y datos de muestra

En www.dielmo.com puede encontrar:

- Más información sobre la tecnología LiDAR.
- Actualizaciones semanales con nuevas funcionalidades.
- Datos de muestra para poder comenzar a manejar el programa.
- Tutoriales para realizar controles de calidad a los datos LiDAR.
- Documentación para el desarrollo de nuevas extensiones.
- Previsión de trabajos futuros
- Cómo colaborar con el proyecto, etc.

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